

ORIGINAL

BEFORE THE
Federal Communications Commission
WASHINGTON, DC 20554

In the Matter of)
)
Western Wireless Corporation) CC Docket No. 94-102
) RM-8143
Petition for Waiver of Section 20.18(c) of the)
Commission's Rules for Digital Wireless Systems)
)
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To: Chief, Wireless Telecommunications Bureau

**PETITION FOR WAIVER OF SECTION 20.18(c)
OF THE COMMISSION'S RULES**

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Pursuant to the Wireless Telecommunications Bureau's *Order* of November 13, 1998 and Section 1.3 of the Commission's rules, Western Wireless Corporation ("Western"), on behalf of its subsidiaries and affiliates, hereby petitions the Bureau for waiver of Section 20.18(c) of the Commission's rules with regard to Western's digital wireless system, effective January 1, 1999.¹ Western demonstrates herein its "commitment to, and plans for, complying with Section 20.18(c)" of the rules such that grant of the requested waiver is warranted. Western also demonstrates herein that (1) there are fundamental technological barriers to carrying TTY calls over digital networks; (2) providing such capability is not readily achievable pursuant to Section 255; and (3) the availability of prospective solutions

¹ See 47 C.F.R. § 1.3; *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Order*, CC Docket No. 94-102, DA 98-2323, ¶¶ 11-12 (rel. November 13, 1998) ("*November 13 Order*").

is ultimately a vendor-driven and dependent issue. As required, Western will supplement the instant Petition with additional responsive information that may become available, including information from vendors, every three months to indicate progress made toward implementation of TTY digital capability and to maintain the instant waiver.²

I. INTRODUCTION

Western is committed to implementing digital TTY capabilities in compliance with Section 20.18(c) and Section 255 of the Communications Act. As the Commission is aware, however, and as the record demonstrates, it is currently technically infeasible for digital wireless carriers, including Western, to comply with Section 20.18(c) by January 1, 1999. Furthermore, while there are promising recent developments which may facilitate a voice-based solution, it does not appear that a technical solution for compliance will be commercially available for some months. TTY devices generate tones (called “Baudot tones”) whenever a key is depressed on the TTY device which are transmitted over the PSTN and delivered to a receiver which, in turn, converts the tones into alphanumeric characters. Access to Western’s network is through digital devices manufactured by third-party vendors according to standards developed by standards bodies. The CPE that third party vendors manufacture for use on Western’s network operates such that messages sent over Western’s network by a TTY device often arrive at their destination in an unreadable form because of the high character error rate (“CER”). This CER is the result of the incompatibility between

² *November 13 Order* at ¶ 11.

vocoders in the network that are optimized for digital reproduction of the human voice and the Baudot tones.

It is also critical that the Commission acknowledge that Western and other CMRS providers are carriers, and not manufacturers of telecommunications equipment. Western is dependent upon unaffiliated companies for its network infrastructure and for the terminal equipment it makes available to customers. Hence, while Western can request certain features or enhancements from its vendors, it is unable to control the development of these features or the rate at which the project proceeds. Moreover, no TTY device now exists that will operate reliably on Western's digital network. These two points alone underscore that compliance with Section 20.18(c) is not readily achievable.

The situation facing the Commission and carriers derives from the current incompatibility of two factors: (1) the rapid deployment of digital wireless technologies; and (2) the Commission's policy objective of ensuring that users of existing incompatible TTY technologies have the ability to use new and evolving digital features. As digital carriers deployed their networks to meet buildout requirements and customer demand, Commission, industry and consumer groups have focused time and resources on developing backward-compatibility solutions for TTY/digital capability. This task has proven difficult and complex to achieve.

A. From the Outset of the E-911 Proceeding There has Been Considerable Uncertainty As to the Scope of Carriers' TTY Obligations and Whether TTY Is Compatible With Wireless Digital Technologies

In the *Second Report and Order* in the Commission's proceeding adopting rules for broadband PCS services, the Commission expressed concern for the availability of E911

capabilities in new broadband PCS systems and announced its intention “to address E-911 and related issues with regard to PCS, cellular, and any other relevant mobile service.”³ In the *Notice of Proposed Rulemaking* initiating that proceeding, the Commission noted at the time that:

[The record was] *not clear* . . . what Commission rules or policies would be *necessary or appropriate* to ensure access to 911 services for TTY-like devices beyond *the general requirement* that services be compatible with such devices.⁴

The Commission further sought “comment on how to ensure access to 911 services by TTY-type devices that use wireless services, and request[ed] comment on the specific additional features, costs and feasibility issues that may be relevant to achieving compatibility.”⁵ In short, there was considerable uncertainty as to the technical obstacles to TTY wireless digital access at the outset of the proceeding.

In its *E911 First Report and Order*, the Commission adopted Section 20.18(c) which sets forth a *general* requirement that cellular, broadband PCS, and certain wide-area SMR providers “be capable of transmitting 911 calls from individuals with speech or hearing

³ *Amendment of the Commission’s Rules to Establish New Personal Communications Services, Second Report and Order*, 8 FCC Rcd. 7700, 7756 (1993) (“*PCS Second Report and Order*”).

⁴ *Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Notice of Proposed Rulemaking*, 9 FCC Rcd. 6170, 6180 (1994) (emphasis added). The Joint Paper filed by PCIA and emergency service organizations on which the *NPRM* proposal was based, stated that to facilitate the requirement that “[t]he wireless system should allow disabled individuals to access emergency services through means [like TDD-capable devices] but this does not impose a requirement that all wireless devices be TDD-capable.” *Id.* at 6194.

⁵ *Id.* at 6180.

disabilities through means other than mobile radio handsets, *e.g.*, through the use of Text Telephone Devices (TTY).’⁶ In that *Order*, the Commission acknowledged concerns raised that certain “vendors have been unable to pass through Baudot frequency signaling without distortion,” that implementing TTY access will require “coordination among many parties, including telecommunications and equipment manufacturing industries, the LECs and the PSAPs,” and that “the establishment of a *common data standard* under which wireless and wireline providers can deliver TTY data to the PSAP is the most important coordination issue for this requirement.”⁷ Moreover, the Commission expressly *rejected* the requests that the Commission adopt specific TTY access standards, including “direct connect capabilities for TTY access” and instead deferred such issues to the Commission’s Section 255 implementation proceeding.⁸ Thus, potential difficulties were brought to the Commission’s attention early on but were not resolved.

The Telecommunications Industry Association (“TIA”) petitioned for reconsideration of the rule, explaining that carriers could not bring digital CMRS systems into compliance because “the vocoders used in digital mobile systems do not reproduce well the signaling

⁶ 47 C.F.R. § 20.18(c).

⁷ *Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, First Report and Order and Further Notice of Proposed Rulemaking*, 11 FCC Rcd. 18676, 18700-01 (1996) (“*E911 First Report and Order*”) (emphasis added).

⁸ *Id.* at 18702. The Commission’s Section 255 proceeding remains pending. *Implementation of Section 255 of the Telecommunications Act of 1996, Access to Telecommunications Services, Telecommunications Equipment, and Customer Premises Equipment by Persons with Disabilities, Notice of Proposed Rulemaking*, WT Docket No. 96-198, FCC 98-55 (rel. April 20, 1998) (“*Section 255 NPRM*”).

tones used by TTYs.”⁹ TIA thus recommended “flexibility in [Commission] regulations to implement TTY/digital wireless E911 compatibility” and deferral of the rule “until *after standards have been developed* and a reasonable implementation timeframe can be discerned.”¹⁰ PCIA similarly noted that different standards would be needed for digital networks “because digital networks, unlike analog networks, distinguish between voice and data transmissions in order to implement such features as error detection and correction.”¹¹ While the Commission in the *PCS Reconsideration Order* declined to defer the digital TTY requirement until standards were developed, it acknowledged the “technical barriers and compatibility problems involved in implementing solutions for TTY users on digital wireless systems.”¹²

Furthermore, the issue of carriers’ TTY/911 obligations remains subject to Section 255. While the Section 255 rulemaking proceeding remains pending, many of the issues under consideration there directly implicate carriers’ TTY/911 obligations. In addition, the Commission’s actions since the *E911 Reconsideration Order* further complicate the matter. Although the Commission has acknowledged the continued technical obstacles of achieving digital TTY capability, it has continued to push for a backward compatibility solution and

⁹ Telecommunications Industry Ass’n, Petition for Reconsideration, filed Sept. 3, 1996, at iii, 12-15; *Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Reconsideration Order*, 12 FCC Rcd. 22665, 22688 (1997) (“*E911 Reconsideration Order*”).

¹⁰ *E911 Reconsideration Order* at 22688.

¹¹ PCIA Petition for Reconsideration, filed September 3, 1996, at 10-11; *Reconsideration Order*, 12 FCC Rcd. at 22688.

¹² *E911 Reconsideration Order*, 12 FCC Rcd. at 22695.

has elevated the importance of the so-called “consumer concerns” discussed in the *September 30 Order*.¹³ These developments have created further uncertainty as to carriers’ digital TTY/911 obligations.

B. The Commission Did Not Mandate A Particular Digital Protocol and Promoted and Facilitated Rapid Digital Broadband PCS Deployment

The Commission’s TTY/911 rules were not adopted in a regulatory void. Rather, Section 20.18(c) was considered and adopted concurrently with other rules and policies that the Commission must acknowledge in order to understand the enormous complexity of the task facing industry today.

1. The Commission Has Tacitly Encouraged and Expressly Facilitated the Digitalization of Wireless Technologies While TTY Technologies Have Remained Unchanged

The Commission decided to initiate a proceeding to determine wireless carriers’ 911 obligations concurrently with its adoption of policies regarding broadband PCS technical standards. In the *PCS Second Report and Order*, the Commission expressly declined to adopt a single digital technology.¹⁴ Indeed, as the Commission itself noted in the E911 proceeding, “[w]e have decided that the marketplace should determine which digital

¹³ *November 30 Order* at ¶¶ 7, 11; *Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Order*, CC Docket No. 94-102, DA 98-1982, ¶ 9 (rel. September 28, 1998) (“*September 30 Order*”); CTIA/PCIA Joint Comments in CC Docket No. 94-102, filed October 30, 1998, at 2 (“Joint Comments”); Letter from Thomas E. Wheeler, President/CEO, Cellular Telecommunications Industry Ass’n, to Chairman Kennard, dated October 28, 1998, at 2 (“Wheeler Letter”).

¹⁴ *PCS Second Report and Order*, 8 FCC Rcd. at ¶¶ 135-37; *see Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, Third Report*, FCC 98-91 (rel. June 11, 1998), at 33 (“*Third CMRS Competition Report*”).

protocols will survive, and we do not intend to reach different conclusions in this proceeding.”¹⁵ The Commission has designed its rules governing CMRS services to *encourage and facilitate* the development of digital technologies, and digital wireless technologies continue to evolve rapidly.¹⁶

The Baudot technologies used in TTY devices, however, have remained fundamentally unchanged for decades.¹⁷ In turn, and as the Forum has demonstrated in its quarterly reports, the disparities between digital and analog technologies have not, to date, permitted development of a “quick fix” solution.¹⁸

2. Broadband PCS Licenses Were Auctioned and Licensees Began Deploying Networks Before Digital TTY Solutions Were Feasible

The Commission completed its auction of A/B Block broadband PCS licensees in March 1995, and the remaining licenses were auctioned through 1996. Consistent with

¹⁵ *E911 First Report and Order*, 11 FCC Rcd. at 18747.

¹⁶ *See PCS Second Report and Order*, 8 FCC Rcd. at 7747; *Pittencrieff Communications, Inc.*, 10 Comm. Reg. (P&F) 430, 430 ¶ 2 (WTB 1997) (merger in public interest in part because it will enable Nextel to perform digital system upgrades that increase capacity and permit expanded services); *Amendment of Parts 20 and 24 of the Commission’s Rules — Broadband PCS Competitive bidding and the CMRS Spectrum Cap, Report and Order*, 11 FCC Rcd. 7824, ¶ 103 (1996) (noting that cellular carriers have been “rapidly implementing digital and other new technologies with their current 25 MHz of spectrum and that even analog cellular systems are increasing subscribership and providing enhanced services”); *Implementation of Sections 3(n) and 332 of the Communications Act, Second Report and Order*, 9 FCC Rcd. 1411, 1471 (1994).

¹⁷ The Commission has long recognized the drawbacks of TTY technologies. *Communications Services for the Deaf and Hearing-Impaired*, 67 FCC 2d 1602, 1603 (1978).

¹⁸ *See* TTY Forum Quarterly Status Report, filed October 14, 1998 in CC Docket No. 94-102, at 3; Joint Comments at 4-7.

Congress' intent and Commission rules, broadband PCS carriers have deployed their networks subject to buildout requirements and in compliance with existing technical standards.¹⁹ They spent billions of dollars at auction for their licenses, and billions more deploying their networks. Western itself launched PCS service in early 1996 — around the same time that the Commission's *E911 First Report and Order* and the general TTY obligations were adopted. As the Commission has acknowledged, consumers have benefited enormously from the competition broadband PCS providers have brought to the CMRS marketplace.²⁰

Behind the scenes, of course, carriers were in the process of purchasing, testing, and deploying equipment and handsets. Thus, a sizeable embedded base of CPE and equipment has been deployed — again, consistent with Commission and statutory objectives — using technologies and digital protocols fundamentally at odds with existing TTY devices. Out of necessity, these activities occurred long before *any* standard for digital TTY was under consideration by industry standards bodies.

C. No Manufacturer of Wireless Digital Handsets Currently Has A Commercially Available Product That Will Enable Carriers to Comply With Section 20.18(c)

As discussed above, the record long before adoption of the *E911 Reconsideration Order* indicated (1) that TTY compatibility over digital networks would be extremely difficult, and (2) carriers would deploy available digital wireless technologies notwithstanding the absence of commercially available digital TTY solutions. Nevertheless,

¹⁹ See 47 U.S.C. § 309(j)(3)-(4); 47 C.F.R. § 24.203.

²⁰ *Third CMRS Competition Report* at 14-22.

manufacturers and CMRS carriers — themselves and through industry groups — have worked in good faith throughout this period to contribute to the Forum’s efforts to develop a short-term solution. The TTY Forum has formally met 8 times since September 1997, and sub-groups, such as the CDMA Development Group, GSM North America (“GSM NA”) and Universal Wireless Communications Consortium, have conducted testing and engaged in formal and informal deliberations throughout that period.

In part at the urging of Commission staff and consumer group participants in the Forum, however, and in light of the impending October 1998 deadline, the Forum focused its efforts on more short-term, backward compatibility solutions.²¹ By mid-1998, it became evident that for GSM carriers, including Western, a voice-based solution would be simply untenable in the near term, and that efforts should be considered to gauge the feasibility of developing and implementing a so-called “data-based” solution.

Nevertheless, in part at the urging of Commission staff and consumer representatives on the Forum, carriers and manufacturers continued to study the possibility of implementing a short-term solution. For GSM technology, tests have revealed a character error rate (“CER”) from 2 percent to 4 percent.²² Western believes that these results would be consistent with the performance of its network. For these reasons, the industry’s conclusion

²¹ See Wireless TTY Forum, Quarterly Status Report, April 10, 1998, Introduction at 3, ¶ I.B; *see also* CTIA Letter at 2.

²² July Quarterly Status Report at 2.

set forth in the October 1998 Quarterly Status Report is equally applicable to all GSM carriers today, including Western:²³

there does not appear to be a voice-based solution in the near future which will allow the Baudot signal of a TTY device to pass through the vocoder of a digital air interface and achieve a character error rate comparable to the character error rate achieved with analog air interface, i.e., less than 1%.

As the Commission has itself acknowledged, “users of TTY devices will not be able to operate such devices in conjunction with digital phones at any time in the near future.”²⁴ With the benefit of 20-20 hindsight, it may be that industry — and the Commission, for that matter — underestimated the complexity of the task before it. Nevertheless, it is clear that in pushing for a short-term, backward-compatibility TTY solution, the Forum and the Commission took a risk in assuming that such a solution would, in fact, be technologically feasible. The Commission must now recognize that there is no readily-achievable quick fix to the problem of transmitting messages from existing TTY devices over Western’s digital network and, indeed, the problem is exacerbated by the “consumer” requirements that the Commission and others have insisted upon as a part of digital TTY capability. Meeting these requirements while overcoming the fundamental technical problem requires research, development, and testing before reliable, affordable devices can be produced. Regulatory fiat alone will not make the obligation readily achievable.

²³ For this reason and others, waiver of Section 20.18(c) is also warranted pursuant to Section 1.3 because the circumstances warrant a deviation from the rule and deviation from the rule will serve the public interest. *See Northeast Cellular Tel. Co., L.P. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969).

²⁴ *Id.* at ¶ 7.

The Commission should thus build upon what the Forum has learned and should promote the development of long-term (and, if possible, readily achievable short-term) solutions.²⁵ Waiver of Section 20.18(c) for digital carriers for a period sufficient for their vendors to develop such solutions is an essential component of this approach.

II. WAIVER SHOWING

A. Steps to Provide Users of TTY Devices with the Capability to Operate Such Devices in Conjunction with Digital Wireless Phones

Western is taking substantive steps toward providing users of TTY devices with the capability to operate such devices in conjunction with digital wireless phones. Western will continue to notify customers that TTY devices cannot be used over a digital network and will notify potential and existing customers when it has a solution available. In addition, Western will continue to ensure that customers using TTY devices are offered analog alternatives, even to the extent of referring customers to a competing carrier where Western has no analog offering in a given market area.

As is typically the case in the standards and product development process, industry's efforts to develop and study possible digital TTY solutions have been undertaken by manufacturers, carriers' trade associations such as CTIA and PCIA, and technology-specific

²⁵ Indeed, the Access Board has recognized that as "technology is constantly changing," Section 255 should not be interpreted "to require obsolete or unmarketable products to be maintained beyond their useful life." The Board therefore determined that Section 255 "does not require that a new product be both accessible *and* compatible" and that "a change which increased accessibility but decreased compatibility would not be prohibited." Architectural and Transportation Barriers Compliance Board, 63 Fed. Reg. 5608, 5620 (Feb. 3, 1998) ("Access Board Guidelines") (emphasis added).

groups such as GSM NA. Furthermore, Western is wholly dependent on the availability of equipment and software from its primary vendors to comply with Section 20.18(c) and to obtain the information necessary to provide the information requested in the *November 13 Order*.²⁶ Subject to these limitations, Western has attempted to make some preliminary determinations as to which of the various solutions currently before the Commission may be feasible for Western's network and, if feasible, the steps that will be necessary to implement the solution.²⁷ To do so, Western has relied in part on the Wireless TTY Forum Workplan (attached as Appendix A), which provides the Commission with a schedule of milestones for developing and implementing technical solutions for TTY users to access 911 over digital wireless systems.

As a preliminary matter, Western personnel have confirmed that the problems associated with carrying TTY calls over digital networks identified by the Forum apply to Western's network, and that the voice-based solutions discussed by the Forum are infeasible for Western's network. As discussed below, Western's engineering personnel are also evaluating the feasibility of implementing the various data solutions currently under consideration at the TTY Forum. Western has formally inquired of its four major vendors as to the availability of potential solutions and the necessary steps for implementing such a solution. To date, Western has received written responses from three of its vendors. Copies

²⁶ The Commission on numerous occasions has acknowledged carriers' reliance on vendors for compliant equipment and software and granted waivers of the applicable rules. *See Roosevelt County Rural Tel. Coop., Inc. et al.*, 13 FCC Rcd. 22, ¶¶ 28-42 (1997).

²⁷ *See Joint Comments at App. A.*

of these letters to vendors are included in Appendix B. Although these vendors believe they have positioned their equipment for future compatibility with TTY devices, all of the vendors responding stressed that a short-term solution is not currently available, and implementation estimates for long-term solutions ranged from 12 to 36 months. All of these vendors are committed to continuing their efforts with the TTY Forum. Western is also committed to continuing its support for and participation in the efforts of GSM NA.

1. Problems with GSM Generally

As CTIA and PCIA have reported to the Commission, GSM technology is optimized to carry voice calls, not TTY calls. Character errors are primarily due to the digital vocoder, which identifies the sound in terms of filter parameters for the vocal track. A TTY Baudot signal is very different from human voice, so the vocoder has difficulty reproducing a sound that matches the Baudot tones. Accordingly, test results supporting TTY calls for GSM made through a digital cellular vocoder have not met the consumer groups' acceptable character error rate ("CER") standard. For GSM technology, tests have revealed a CER from 2 percent to 4 percent,²⁸ which exceeded the analog CER of less than 1% favored by the consumer groups.

The primary causes for incompatibility between TTY devices and GSM systems that have been identified are vocoder distortion, received signal level, multi-path fading effects, receiver attack time, hand-offs, adjacent and co-channel interference, various network

²⁸ *Id.* at 5; July Quarterly Status Report at 2.

effects, and the performance of TTY devices.²⁹ As a GSM carrier, Western has confirmed internally that these findings with respect to the feasibility of various digital TTY solutions are also applicable to its network.³⁰

2. Voice-Based Solutions Are Currently Infeasible

Western believes that voice-based solutions, whereby the Baudot signal passes through the vocoder, are generally infeasible for its GSM network because the CER for TTY devices is unacceptably high, as discussed above. Furthermore, Western understands that none of these short-term solutions currently provide for reliable service in a mobile environment — thus defeating the purpose of imposing a TTY requirement on “commercial *mobile* service” providers.

- ***Direct Audio Connection.*** Western does not believe that this solution is a viable short-term solution. Direct audio connection requires modification and an adapter to TTY devices, yields no improvement in the CER, and supports only limited features. Furthermore, the timetable for developing the necessary equipment has not been set by the manufacturer. Western is therefore not currently pursuing this as an option.

- ***RJ-11-Type Modular Connection/Jack.*** The TTY Forum believes that this is not a viable short-term solution. Western is not, therefore, currently pursuing this as an option.

- ***Acoustic Solution.*** This solution is highly susceptible to background noise and requires a landline handset and cable. Western believes that certain manufacturers are

²⁹ Joint Comments at 5.

³⁰ See Attachment C, Declaration of Michael Raap.

developing an acoustic coupling device for TTY devices that is designed to interface between wireless phones and TTY device rubber cups. Further development and testing is necessary to determine whether this device will meet the TTY Forum's requirements. The timetable has yet to be developed by the manufacturer.

- ***True RJ-11 Connection.*** This is not a viable short-term solution. Use of the handset is limited, an additional power supply is required, and it is expensive. Therefore, Western is not currently pursuing this as a short-term solution, although this approach may be utilized over the long-term for product development.

- ***Vocoder Modifications.*** This solution is not cost effective, has the potential to degrade voice quality, and would require an extensive international standards development and implementation process. Western is therefore not currently pursuing this as an option.

- ***Proprietary Solutions.*** By definition, other carriers' proprietary solutions are not available to Western to evaluate and test. Western will evaluate the feasibility of such solutions as they become available.

B. Long-Term Data-Based Solutions

Western has reviewed the data-based solutions currently before the Commission. While the solutions may be technically feasible, they can be implemented only at considerable cost and, in any event, will not likely be commercially available for sometime and, again, availability is entirely dependent on vendors. Thus, it is unclear if these solutions are readily achievable, as required under Section 255.

- ***Inter-Working Function ("IWF"); V.18 (Baudot); Proprietary TTY Modem.*** These solutions would provide reliable communications equivalent to landline service, and

require little or no modifications to existing TTY devices. They are also compatible with nearly all Baudot standards. However, not all carriers may choose to implement data services. If they do, a mobile connection interface to existing TTYs will be required. However, IWF does not support voice carryover, and IWF with Baudot is not commercially available. The expected development and manufacturing timetable is 12-18 months, which does not include the time for carrier testing and implementation. Western is pursuing these options through its vendors.

- **Third Party Gateway.** This approach entails providing a TTY-911 user with a number to access an IWF operated by a third party, which would then complete the call to a landline TTY. Western agrees with the TTY Forum that this is not a viable solution because it would be too expensive to operate and maintain. Western is therefore not currently pursuing this as an option.

III. STEPS TO ADDRESS “CONSUMER CONCERNS”

In the *September 30 Order*, the Bureau required that the Forum finalize the “draft workplan” for its future activities and further provided that “approval of the workplan must be obtained *from all groups* participating in the Forum.”³¹ The Bureau stated that:

We note, in this regard, that it will be necessary for the workplan to address consumer concerns. For example, consumer representatives recently provided to the Forum member groups a list of criteria that the consumer representatives *would like to be incorporated* into any solutions implemented by the Forum.³²

³¹ *September 30 Order* at ¶ 9.

³² *Id.* (emphasis added).

Attached to the *September 30 Order* was the memorandum submitted to the Forum by its consumer representatives, listing thirteen desired “functional characteristics” to be incorporated into TTY solutions.³³

In the *September 30 Order*, the Commission simply observed that consumer representatives on the Forum had submitted these concerns to industry representatives. In the *November 13 Order*, however, the Commission appears to have elevated the importance of these concerns, determining that for a carrier “to demonstrate [its] commitment to, and plans for, complying with Section 20.18(c)” it must “specify with sufficient particularity” the “reasonable steps the carrier will take to address the consumer concerns referenced in the *September 30 Order*.”³⁴

Western is uncertain whether the Bureau has attempted to now elevate the so-called “consumer concerns” into *de facto* regulatory obligations or technical standards. In this regard, Western notes that: (1) the Commission has *not* put the consumer concerns on public notice; (2) has *not* amended Section 20.18(c) to incorporate the consumer concerns into the rules; and (3) the feasibility of incorporating the consumer concerns are currently issues before the Forum and appropriate industry standards bodies. Western therefore presumes that the Bureau has incorporated the consumer concerns into this proceeding for informational purposes. Thus, pursuant to the *November 13 Order*, Western below discusses the extent to which possible TTY solutions address the consumer concerns.

³³ *Id.* at App. A.

³⁴ *November 13 Order* at ¶¶ 10-11.

As the Commission is aware from the most recent Forum report, industry has determined that the various voice- and data-based solutions support the consumer concerns in varying degrees.³⁵ As discussed above, Western has determined that the various voice-based solutions are not feasible for Western's network. It appears that the proposals which may be feasible for Western's network support most of the consumer concerns; Western cautions, however, that additional testing will be required to confirm the extent to which the consumer concerns will be supported.³⁶ In addition, the availability of enhanced 911 features such as ALI and ANI will depend on whether PSAPs have the capability to receive such calls — a matter over which carriers have no control.

IV. COMPLIANCE WITH SECTION 20.18(C) IS NOT READILY ACHIEVABLE FOR DIGITAL CMRS PROVIDERS

The plain text of the statute demonstrates that wireless carriers' obligations with regard to TTY devices are governed by Section 255.³⁷ Thus, the Commission's enforcement of Section 20.18(c) must comply with Section 255's "readily achievable" standard. In this regard, the Access Board has determined that its guidelines are "'prospective in nature', intended to apply to future products."³⁸ Indeed, the Commission itself has echoed that sentiment, tentatively concluding that:

[O]nce a product is introduced in the market without accessibility features that were not readily achievable at the time, Section 255 *does*

³⁵ See TTY Forum Workplan at 11-17 ("Workplan").

³⁶ See *id.*

³⁷ See 47 U.S.C. § 255.

³⁸ Access Board Guidelines, 63 Fed. Reg. at 5612.

*not require that the product be modified to incorporate subsequent, readily achievable access features.*³⁹

As discussed herein, compliance with the TTY obligation is not readily achievable and the Commission may not require Western to have such capability until it is readily achievable. Indeed, the question is raised whether the imposition of a backward compatibility solution is appropriate — or statutorily required — at all.

A. Section 255 Governs Wireless Carriers' TTY Obligations

Throughout the proceeding, the Commission has relied on the Americans with Disabilities Act (“ADA”) as a principal basis for its wireless TTY requirement.⁴⁰ Section 255 of the Act — on which the Commission also relies — further clarifies wireless carriers’ obligations regarding access to the disabled.⁴¹ Importantly, both the ADA and Section 255 impose limits on what the Commission can require of carriers. Section 255 provides that “[a] provider of telecommunications service shall ensure that the service is accessible to and usable by individuals with disabilities, *if readily achievable.*”⁴² A provider must also “ensure that [its] service is compatible with *existing peripheral devices or specialized customer premises equipment commonly used by individuals with disabilities* to achieve access, *if*

³⁹ Section 255 NPRM at ¶ 120 (emphasis added); *see also Access Board Guidelines*, 63 Fed. Reg. at 5612.

⁴⁰ *See E911 Reconsideration Order* at 22686; *E911 First Report and Order*, 11 FCC Rcd. at 18699; *E911 NPRM* 9 FCC Rcd. at 6180, n.55.

⁴¹ *See E911 Reconsideration Order* at 22687; *E911 First Report and Order*, 11 FCC Rcd. at 18699.

⁴² 47 U.S.C. § 255(c) (emphasis added).

readily achievable.”⁴³ “Readily achievable,” in turn, is defined under the ADA as “easily accomplishable and able to be carried out without much difficulty or expense” taking into account factors relating to the nature and cost of the action.⁴⁴

The Access Board has already determined that specialized customer premises equipment includes TTY devices.⁴⁵ Furthermore, the Commission’s TTY/911 requirement involves more than enabling TTY users to use digital wireless networks to make *911* calls; rather, it necessitates enabling TTY users to make *any* call over a digital wireless network. Thus, at issue is more than a “911” issue, but a broader access issue which Congress expressly intended be governed by Section 255.

B. Compliance with Section 20.18(c) Is Not Readily Achievable

The Commission has proposed a three-step inquiry for determining “whether a particular telecommunications access feature” is “readily achievable:” (1) is the feature feasible? (2) if so, what would be the expense of providing the feature? and (3) given its expense, is the feature practical? By this standard, and any reasonable interpretation of Section 255, digital/TTY compatibility is not readily achievable by January 1, 1999, and will not be readily achievable for a considerable period of time. Moreover, backward compatibility may not be readily achievable at all.

As demonstrated above, it is technologically infeasible to provide TTY access to digital wireless technologies at this time and, as the Commission has tentatively determined

⁴³ 47 C.F.R. § 255(d) (emphasis added).

⁴⁴ See 42 U.S.C. § 12181(9), 47 U.S.C. § 255(a)(2).

⁴⁵ Access Board Guidelines, 63 Fed. Reg. at 5615-16.

in the Section 255 proceeding, technological or physical infeasibility are “various reasons why a particular feature might not be feasible.”⁴⁶ While TTY/digital compatibility may be feasible at some future date, the record demonstrates that it is not technologically feasible now — or for sometime yet — to implement such capability. Furthermore, implementation of a data-based solution will be an expensive undertaking. While some carriers have announced plans to deploy data wireless capabilities, whether they do so must remain a business decision rather than a regulatory obligation. Upgrading Western’s network to accommodate digital/911 compatibility requires the capability to carry any TTY call — not just 911 calls. To do so on a long-term basis further requires implementation of data wireless capabilities which, in turn, may involve an entire reconfiguration of the company’s business plans. In light of these factors — technical infeasibility and cost — TTY digital compatibility is not practical.

V. WESTERN HAS SHOWN GOOD CAUSE FOR THE WAIVER

Waiver of the Commission’s rules is warranted where special circumstances warrant a deviation from the general rule and such deviation will serve the public interest.⁴⁷ The Commission has, on numerous occasions, determined that the nonavailability of compliant equipment and software from manufacturers constitutes “special circumstances.”⁴⁸

⁴⁶ *Section 255 NPRM* at ¶¶ 101-102.

⁴⁷ *See Northeast Cellular Tel. Co., L.P. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969).

⁴⁸ *See Roosevelt County Rural Tel. Coop.*, 13 FCC Rcd. at ¶¶ 28-42; *see also* 47 C.F.R. § 24.819 (waiver may be warranted where “unique facts and circumstances of a particular case render application of the rule inequitable, unduly burdensome (continued...)”).

Furthermore, grant of the waiver request will serve the public interest by enabling Western to continue to evaluate digital solutions and, once such solutions become commercially available, test and implement same. Users of TTY devices may continue to use analog wireless technologies, and Western will continue to notify consumers of the need to use to analog technologies until a digital solution is implemented.

VI. CONCLUSION

For the foregoing reasons, Western respectfully requests that the Commission grant the instant petition for waiver of Section 20.18(c) until a long-term TTY solution is implemented.

Respectfully submitted,

WESTERN WIRELESS CORPORATION



By: Gene DeJordy
Western Wireless Corporation
3650 131st Avenue, SE
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(425) 586-8700

Its Attorney

December 4, 1998

⁴⁸

(...continued)
or otherwise contrary to the public interest” and where there is “lack of a reasonable alternative.”)

ATTACHMENT A

PROPOSED WORKPLAN

I. Assessment of Test Results and Finalization of Test Plan

The TTY Forum has provided preliminary test results and demonstrations on several potential methods for addressing incompatibility between TTYs and the different wireless digital technologies. The TTY Forum developed a uniform test script that manufacturers representing various digital technologies and at least one TTY manufacturer have used in their testing. Test results, however, indicate a wide variance in the character error rate. Furthermore, trying to isolate the cause of the problem within a short time period has been a Herculean yet circumspect task with no conclusive results to date. While the goal is to minimize the character error rate, particularly in 9-1-1 situations, a certain character error rate is inherent with wireline and wireless, both analog and digital technology, and TTY devices.

The co-chairs of the TTY Forum have acknowledged the need for the development of a consistent test methodology, a uniform method of evaluating the test results ("test plan") and TTY performance standards to determine the minimal level of character error rate that TTY users can expect with certain digital technologies used with certain TTY devices.¹

A. Independent review and assessment of tests conducted to date.

The TTY Forum has requested Dr. Dale Hatfield, Chief of the FCC's Office of Engineering and Technology ("OET") to review and assess the tests conducted to date. It is anticipated that Mr. Hatfield will provide guidance to the TTY Forum on the soundness of the research conducted to date and identify any discontinuity or gaps in such research that should be explored in the development of a standardized test procedure.

¹ Since the September 1998 TTY Forum, the wireless industry has reviewed the initial test results and has concluded that additional testing would not yield new or significant information on character error rates. The wireless industry has acknowledged that there does not appear to be a voice-based solution in the near future which will allow the Baudot signal of a TTY device to pass through the vocoder of a digital air interface and achieve a character error rate comparable to the character error rate achieved with analog air interface, *i.e.*, less than 1%. Nevertheless, the wireless industry has agreed to conduct further testing to assess character error rates and in accordance with the standardized Test Procedure.

Target Date

Review and assess tests conducted to date -**Task Completed**

B. Finalization of a Standard Test Procedure

The TTY Forum with the assistance of the wireless digital technology groups² shall develop a uniform test process designed to limit and control test variables and establish a test methodology yielding better consistency in determining and comparing character error rates ("CER") across the various digital wireless technologies (CDMA, TDMA, GSM 1900, iDEN). Each wireless digital technology group has assumed responsibility for modifying the test process to accommodate testing variances of that technology.

- ◇ Draft Test Procedure – **Task Completed**
- ◇ Submit Test Process to Wireless Digital Technology Groups – **Task Completed**
- ◇ Responses due from wireless digital technology groups regarding modifications, locations of test facilities and test schedules – **10/28/98**
- ◇ Review responses from wireless digital technology groups (Test Plan Sub-task Group) – **10/28/98 – 10/29/98**
- ◇ Submit Test Procedure to FCC and distribute to wireless manufacturers and carriers – **10/30/98**
- ◇ Status Report to TTY Forum – **11/4/98**
- ◇ Review and Feedback on Test Procedures – **TBD by FCC**

C. Conduct additional tests using Test Procedures and compare new results

Each wireless digital technology group shall identify at least one test facility and advise the TTY Forum as to the availability of the test facility in order to commence testing prior to April 1999.³ Wireless manufacturers and carriers will conduct tests in accordance with the test schedules submitted and return results to

² For purposes of the Workplan, wireless digital technology groups refers to the CDMA Development Group ("CDG"), GSM North America, and Universal Wireless Communications Consortium ("UWC Consortium").

³ GSM NA has indicated that it plans to commence testing as soon as possible with a target date of January 1999 to provide test results to the TTY Forum and the FCC, provided that the following are true: 1) the test specification with modifications suggested by the GSM NA is approved and released by October 30, 1998; 2) lab based testing with real world conditions is accepted; 3) the test specification does not change dramatically; 4) manufacturers can assist the test facilities to set up the test; and 5) no unforeseen restrictions are placed on the testing.

the TTY Forum and the FCC as soon as available. TTY Forum members shall concurrently continue to research acceptable error rates, voice-based and data-based solutions during the test schedule.

The TTY Forum will provide advance notice to all interested parties of the test dates, location of the test laboratories, and contact person. Technical representatives of TTY manufacturers, Gallaudet University, PSAPs and the FCC are encouraged to participate in the testing and should contact the appropriate manufacturer or carrier conducting the test to discuss participation.

Goals and Target Dates

Refer to Test Procedure for list and availability of test labs and scheduled target dates for conducting the additional tests.

D. Analysis of test results and recommendations

The TTY Forum will review and analyze the test results and provide specific comments and recommendations to the FCC based on the test results.

Goals and Target Date

To be determined by the Steering Committee of the Wireless TTY Forum at TTY Forum - 9 scheduled for November 4-5, 1998

II. User Requirements

Consumer representatives of the TTY Forum have provided the TTY Forum with two documents outlining their criteria with respect to solutions: *Consumer Approved Criteria for Acceptance of 'One Phone Model Per Service Provider as of October 1' Proposal* ("Consumer Criteria Document") and *September 10, 1998 Memorandum from Consumer Representatives to TTY Forum* ("September 1998 Consumer Memo").

A. Consumer Criteria Document

The purpose of the document was to stimulate discussion and solicit the views of the wireless carriers and manufacturers participating in the TTY Forum. At the September 1998 TTY Forum Meeting, CTIA, on behalf of its members, submitted its comments to the criteria set forth in the Consumer Criteria Document.⁴ CTIA's senior staff and the drafters of the Consumer

⁴ Letter from Andrea Williams, Assistant General Counsel, Cellular Telecommunications Industry Association, to Ed Hall and Mary Madigan, Co-Chairs, Wireless TTY Forum, Sept. 8, 1998. Attached to October Quarterly Status Report as Appendix Q.

Criteria Document shall meet at a mutually agreeable time to address the criteria in the context of CTIA's inter-disciplinary approach to accessibility under Section 255.

Goals and Target Date

Meeting to be held on a mutually agreeable date but no later than December 15, 1998.

B. September 1998 Consumer Memo

On September 10, 1998, representatives of the consumer groups circulated a document to members of the TTY Forum outlining a new set of criteria to address only functional characteristics of any proposed solution for TTY access to digital wireless systems.⁵ In accordance with the FCC's Extension Order, the TTY Forum shall consider whether the criteria set forth in the September 1998 Consumer Memo is supported in the proposed voice-based and data-based solutions set forth in this Workplan. Consideration of the criteria shall be documented in a matrix of proposed technical solutions.

Goals and Target Date

- ◇ Develop matrix of proposed technical solutions - **Task completed**
- ◇ Finalize matrix (Task Force Members) - **Task Completed**
- ◇ Submit matrix with Workplan to FCC - **10/30/98**

III. Performance Standards for TTY Devices

Over the past several months, there has been significant discussion concerning the lack of uniform performance standards among TTY devices. Manufacturers of wireless handsets have indicated that such standards are critical in trying to address the technical challenges of voice-based solutions, including passing the Baudot signal of a TTY device over a digital air interface without any modification to the handset or the TTY device. The TTY Forum also discussed the need for a list of "most often used" TTY devices and specifications for each device if TTY

⁵ Memorandum from Consumer Representatives to TTY Forum, Sept. 10, 1998. Attached to October Quarterly Status Report as Appendix R.

The FCC's Wireless Telecommunications Bureau has elevated the new list of criteria by attaching it to the Extension Order as an appendix and holding it out as an example of what consumer groups would like to have incorporated into any solution implemented by the Forum, and therefore the workplan. See Extension Order at 4.

manufacturers are not using the EIA Draft Standard.⁶ While CTIA has had initial discussions with one TTY manufacturer concerning whether TTY manufacturers would agree to use of the EIA Draft Standard, the TTY Forum is the most appropriate place for discussion and resolution of this issue.

Goals and Target Dates

Discussion of TTY manufacturers' willingness to incorporate EIA Draft Standard - **TTY Forum - 9 (11/4/98-11/5/98)**

Incorporation of EIA Draft Standard or provision of list of "most often used" TTY devices and specifications - **Date TBD at TTY Forum - 9 (11/4/98-11/5/98)**

IV. Proposed Technical Solutions

To provide TTY users with a variety of solutions and to allow manufacturers and service providers maximum flexibility to develop innovative technology and services for TTY users, the TTY Forum has posed several voice-based and data-based solutions. The TTY Forum presently does not support any one solution over others. The TTY Forum has developed a matrix of proposed voice-based and data-based solutions. The matrix sets forth the implementation stages, the advantages and disadvantages of each solution, whether the consumer requirements set forth in the September 1998 Consumer Memo are supported, and the corresponding milestones scheduled for each phase of implementation. Please refer to Appendix C: Solutions Matrix and WorkPlan for target dates where applicable.

A. Proposed Voice-Based Solutions

The TTY Forum defines voice-based solutions as those solutions whereby the Baudot signal passes through the Vocoder. Proposed voice-based solutions include connection method solutions such as:

- ◆ Direct Audio Connection
- ◆ RJ-11-type Modular Connection/Jack (Analog Solution)
- ◆ True RJ-11 Connection
- ◆ Acoustic Solution
- ◆ Proprietary Solutions

Other proposed voice-based solutions include solutions that may require modification of the Vocoder.

⁶ See Electronic Industries Association, Memorandum to Parties Interested in EIA Standards Project PN 1663, Telecommunications Devices for the Deaf, May 16, 1988, 1. Attached to October Quarterly Status Report as Appendix J.

Direct Audio Connection

It appears that coupling via a direct audio connection between the TTY device and a digital wireless handset, i.e., a 2.5 mm audio interface, is a preferred voice-based solution for some wireless carriers. A proposal for a wireless phone 2.5mm audio interface to TTY devices has been submitted to the TTY Forum.⁷ The proposal noted that audio output and input levels are different for each make and model phone. Thus, manufacturers of wireless phones would need to provide a special adapter with standard levels. Moreover, audio output and input levels of TTY devices have yet to be defined. The proposal recommended a "common interface" to resolve the variance in output and input levels.⁸ While the TTY Forum has reviewed a draft Technical Information Document ("TID"), the TID will be finalized at TTY Forum-9 and will be distributed to manufacturers and carriers shortly thereafter.

Acoustic Solution

Ericsson has indicated that it plans to pursue this option. Due to the confidential nature of Ericsson's marketing plans for this option, the TTY Forum recommends that the FCC meets with the manufacturer under confidentiality to discuss specific implementation plans and scheduled milestones.

RJ-11-type Modular Connection/Jack (Analog Solution)

The TTY Forum has discussed this option and does not consider it to be a viable short-term solution. Thus, the Forum has not pursued development or implementation of this option.

True RJ-11 Connection

The TTY Forum has discussed this option and does not consider it to be a viable short-term solution. Thus, the Forum has not pursued development or implementation of this option.

Proprietary Solutions

Several proprietary solutions such as the Mobility™ TTY, an enhanced TTY device developed by Lober & Walsh Engineering, the AxCell Interface Device developed by Sendele Wireless Communications and the RangeStar™ Technology developed by RangeStar International, have been presented to the TTY Forum for consideration as solutions. Due to

⁷ See Proposed - Wireless Phone 2.5mm Audio Interface to TTY/TDD ("2.5mm Audio Interface Proposal"). Attached to October Quarterly Status Report as Appendix K.

⁸ See 2.5mm Audio Interface Proposal at 3-4. Attached to October Quarterly Status Report as Appendix K.

the proprietary nature of these solutions, the TTY Forum has not been privy to how soon these products will be made commercially available. The TTY Forum recommends that the FCC meets with each company separately and under confidentiality to discuss specific implementation plans and scheduled milestones.

B. Proposed Data-Based Solutions (Circuit-Switched)

The proposed data-based solutions include Inter-Working Function solutions, Third Party Gateway and Proprietary Data-based solutions.

Inter-Working Function Solutions

These solutions rely on the development and installation of the appropriate inter-working function (IWF) software into a wireless carrier's network infrastructure. There are at least two proposed IWF solutions: the V.18 standard and proprietary TTY modems. While the standards for GSM, TDMA, iDEN and CDMA support the IWF functionality, minor modifications are necessary for TTY applications. Implementation of IWF solutions requires completion of product development and deployment, including billing capabilities for data, installation of TTY software in the subscriber terminal, installation of the IWF infrastructure which may be installed per switch or shared among a carrier's switches. In addition, V.18 capable modems need to be manufactured for use in the United States. The estimated timeframes set forth in the Matrix are contingent upon several factors: availability of modems incorporating V.18 standard or other enhanced protocols; timely resolution of any unanticipated technical glitches in product development and deployment as well as installation of the IWF infrastructure; and the availability of the appropriate engineering staff.

Third-Party Gateway Solution

Another proposed data-based solution is a Third Party Gateway Solution which is a solution using the Inter-working function (IWF) but it need not be installed in every carrier's network. A third party vendor would supply a number for a TTY user to call into and then complete the call to a landline TTY using the IWF. This is a very recent proposed solution and has not been fully explored by any members of the TTY Forum. The TTY Forum will discuss at TTY Forum – 9 whether to support this proposed data-based solution.

Proprietary Data-based Solutions

To be reviewed at future TTY Forums.

V. Notification to Subscribers and Potential Subscribers who use TTYs

In compliance with the FCC's rules, wireless carriers have notified subscribers and potential subscribers that they may not be able to use TTYs to access 9-1-1 over digital wireless systems. Wireless carriers, with the support of the wireless trade associations, the consumer advocacy groups, TTY manufacturers and wireless handset manufacturers, will continue to notify subscribers and potential subscribers at appropriate intervals until a product is commercially available.

Goals and Target Date

On-going until product is commercially available.

APPENDIX C

SOLUTIONS MATRIX AND WORKPLAN

Task Force Members to Complete the Data Base Solutions Matrix:

- Todd Lantor
- Norm Williams
- Judy Harkins
- Ron Schultz
- Nikolai Leung
- Mohamed El-Rayes
- UWCC member
- Steve Coston
- John Suprock
- Brye Bonner

Group is empowered to complete matrix below on behalf of the TTY Forum.

PROPOSED VOICE-BASED SOLUTIONS
(Passing Baudot signal through the VOCODER)

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
<i>Direct Audio Connection</i> (2.5 mm Jack – Preferred Method)	<ol style="list-style-type: none"> 1. Finalize Technical Information Document, 2. SRD, 3. Develop Standard, SDO 4. Notify TTY Phone Manufacturers 	<p>Advantages:</p> <ul style="list-style-type: none"> • Cost effective • Small in size • Rapid to implement • High Immunity to interference • Recognized industry connector • Does not require additional power supply • May allow connection to other devices <p>Disadvantages:</p> <ul style="list-style-type: none"> • Requires modification/ adapter to TTY • Yields no inherent improvement to CER • Supports only limited features 	<ol style="list-style-type: none"> 1. Preferred over acoustic 2. Supported 3. Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A 	<ol style="list-style-type: none"> 1. Nov 1998 2. Submit to TR45.1 – (Ericsson liaison) date TBD 3. Ericsson to identify timetable with TR45.1 – actual date to be posted on listserve 4. TBD by #3

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
<i>RJ11-type Modular Connection/ Jack</i> (Analog Solution)	1. Develop Technical Information Document, 2. SRD, 3. Develop Standard 4. Notify TTY Phone Manufacturers	Advantages: <ul style="list-style-type: none"> • Could support full functionality • Could support some of the embedded base of TTYs Disadvantages: <ul style="list-style-type: none"> • Physical size • Cannot use handset for VCO functions (may require separate device for HCO/VCO) 	1. Preferred over acoustic 2. Supported 3. Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A	This option is not considered a short-term solution by the Forum and therefore is not being pursued by this Forum at this time.

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
<i>Acoustic solution</i> – use of external landline handset	1. No Standardization required	Advantages: <ul style="list-style-type: none"> No standardization required Supports most embedded base of TTYs Very Low interface cost Short development cycle Easily accessible to standardized landline handsets Disadvantages: <ul style="list-style-type: none"> Highly susceptible to background noise Bulky – requires a landline handset and cable 	1. Could negatively impact CER 2. Supported 3. Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A	TBD by manufacturer
<i>Proprietary</i> <ul style="list-style-type: none"> Phone Products Terminals 	Unknown	Unknown	Unknown	Unknown FCC can meet with stakeholders

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
<i>True RJ-11 Connection</i>	<ol style="list-style-type: none"> 1. Develop Technical Information Document, 2. SRD, 3. Develop Standard 4. Notify TTY Phone Manufacturers 	<p>Advantages:</p> <ul style="list-style-type: none"> • Supports full functionality • Support some of the embedded base of TTYs <p>Disadvantages:</p> <ul style="list-style-type: none"> • Physical size • Cannot use handset for VCO functions (may require separate device for HCO/VCO) • Requires additional power supply • Expensive • Bulky 	<ol style="list-style-type: none"> 1. Preferred over acoustic 2. Supported 3. Supported 4. Not Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. Supported 10. N/A 11. N/A 12. N/A 13. N/A 	This option is not considered a short-term solution by the Forum and therefore is not being pursued by this Forum at this time.

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
Vocoder Modifications		<p>Not cost effective</p> <p>No modification to TTY</p> <p>Using Full rate</p> <p>Extensive international standards development and implementation process.</p> <p>Could provide more reliable CER</p> <p>Potential to degrade voice quality.</p> <p>Error detection and correction would be lower for a data tone call compared to data services.</p>	<p>1. TBD</p> <p>2. Supported</p> <p>3. Supported</p> <p>4. Supported</p> <p>5. TBD</p> <p>6. Supported</p> <p>7. Supported</p> <p>8. Supported</p> <p>9. TBD</p> <p>10. Supported</p> <p>11. Supported</p> <p>12. TBD</p> <p>13. TBD</p>	<ul style="list-style-type: none"> Develop new standard. Test new standard for baudot and voice.

PROPOSED DATA-BASED SOLUTIONS – Circuit-Switched

Proposed Solution	Testing/Implementation	Advantages/Disadvantages	Consumer Requirements Supported	Milestones
Inter-Working Function (IWF): <ul style="list-style-type: none"> V.18 (Baudot) Proprietary TTY Modem 	<ul style="list-style-type: none"> Complete Data SRD CDMA existing IS-707 TDMA existing IS-135 Standards Modifications TBD based on SRD. Test with existing TTYs for both inbound and outbound calls. Test with PSAP, existing TTY using existing standards 	<p>Advantages:</p> <ul style="list-style-type: none"> Reliable Communications, as good as wireline. World-wide Standard Requires little or no modifications to existing TTY Could support more platforms, TTYs, PDAs, and Laptops. <p>Disadvantages:</p> <ul style="list-style-type: none"> Not all Carriers may choose to implement data services. Compatible with all current Baudot standards, except Ultratec's Turbocode. Require mobile connection interface to existing TTYs. IWF do not support VCO IWF with Baudot not commercially available 	<ol style="list-style-type: none"> Supported TBD TBD N/A TBD Supported Supported Supported Not Supported Supported TBD Supported Supported 	<ul style="list-style-type: none"> Est. Timetable 12-18 months Implement Baudot/V.18 in the IWF Widespread deployment of the IWF Update handsets to support data service.

Proposed Solution	Testing/ Implementation	Advantages/ Disadvantages	Consumer Requirements Supported	Milestones
<i>3rd Party Gateway</i>		Advantages: <ul style="list-style-type: none"> Landlines TTY do not need to be modified. Disadvantages: <ul style="list-style-type: none"> Expensive to operate and maintain. 	1. TBD 2. Not Supported 3. Not Supported 4. Supported 5. TBD 6. Supported 7. Supported 8. Supported 9. TBD 10. N/A 11. Not Supported 12. Supported 13. TBD	This option has not been fully explored by any members of the TTY Forum.
<i>Proprietary</i>	Unknown	Unknown	Unknown	Unknown FCC can meet with stakeholders

*V.18 Letter to modem manufacturers will be drafted by Dick Brandt under the TTY Forum letterhead requesting support for TTY issue.

STANDARD TEST PROCEDURE

In order to meet the requirements of the FCC's October 30, 1998, deadline, the TTY Forum with the assistance of the wireless digital technology groups¹ developed and are finalizing a uniform test methodology ("Test Procedure") to compare character error rates technology by technology (CDMA, TDMA, GSM 1900, iDEN). The TTY Forum has developed four (4) separate documents that are specific to these individual technologies addressed, yet are equivalent in methodology and procedural guidelines necessary to record comparable test results within each technology. These documents are considered "living" documents and are subject to modifications upon initiating the Test Plan (s) described.

While the intent of these documents are to provide uniform test guidelines whereby achieving comparable test results for all technologies, the TTY Forum clearly understands that there are differences within each technology. Therefore, all proposals for change will be reviewed to ensure that the documents do not lose the intended "standardization" between technologies for which they were developed. Attached are the Test Procedure documents representing wireless technologies TDMA, iDEN, and GSM 1900.²

Below is a list of testing facilities, recommended dates, as provided by each wireless digital technology group.

GSMNA

Ericsson Facility
Cetecom Facility
Nokia Type Approval Center

GSM NA plans to commence testing as soon as possible with a target date of January 1999 to provide test results to the TTY Forum and the FCC, provided that the following are true: 1) the test specification with modifications suggested by the GSM NA is approved and released by October 30, 1998; 2) lab based testing with real world conditions is accepted; 3) the test specification does not change dramatically; 4) manufacturers can assist the test facilities to set up the test; and 5) no unforeseen restrictions are placed on the testing.

CDG

Sprint
No information provided on availability of test facility.

UWCC

No information provided on test facility or availability.

IDEN

No information provided regarding test facility or availability.

¹ For purposes of the Workplan, wireless digital technology groups means the CDMA Development Group ("CDG"), GSM North America, and Universal Wireless Communications Consortium ("UWC Consortium").

² The CDG did not submit any modifications to the Test Procedure by the October 30, 1998, filing date. The TTY Forum assumes the CDG will submit its modifications directly to the FCC for review.

ATTACHMENT B



December 2, 1998

via Facsimile

Ms. Heidi Lax
Nokia
6000 Connection Drive
Irving, Texas 75039

Re: Request for Information Concerning Digital 911/TTY
Capabilities for December 4, 1998, Waiver Request

Dear Ms. Lax:

Section 20.18 of the Federal Communications Commission's ("FCC" or "Commission") rules requires that certain CMRS providers, including Western Wireless Corporation ("Western"), "be capable of transmitting 911 calls from individuals with speech or hearing disabilities through means other than mobile radio handsets, e.g., through the use of Text Telephone Devices (TTY)" and that Phase I and Phase II enhanced 911 capabilities be provided for such calls as well.¹ The rule went into effect on October 1, 1998, but the Wireless Telecommunications Bureau ("Bureau") has suspended enforcement of the rule for carriers with digital wireless systems through December 31, 1998.²

However, the Bureau has also established a waiver procedure for carriers not in compliance with the rules beginning January 1, 1999. To this end, affected carriers must "demonstrate their commitment to, and plans for, complying with Section 20.18(c)" Waiver petitions must be filed not later than December 4, 1998, and carriers must file submissions every three months after the date of the waiver grant to maintain the effectiveness of the waiver.

As discussed herein, we are highly dependent on our vendors in preparing our waiver petition. Accordingly, we formally seek your immediate and continuing assistance in providing information needed to prepare a waiver petition and ask that you contact us upon receipt of this letter and provide us with a written response on or before December 3, 1998 to give Western adequate time to prepare its petition. If you are unable to provide information by this date, please inform us in writing when information responsive to the Commission's requirements (discussed below) will be available.

¹47 C.F.R. § 20.18.

²See *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Order, CC Docket No. 94-102, DA 98-1982, (rel. September 30, 1998) ("*September 30 Order*"), and Order, DA 98-2323, ¶¶ 13-14 (rel. November 13, 1998) ("*Order*").

The Bureau in its Order acknowledges that “users of TTY devices will not be able to operate such devices in conjunction with digital phones at any time in the near future.”³ The Commission has nonetheless “establish[ed] a waiver mechanism that requires carriers to provide specific information (including well-documented timetables and milestones) regarding their” compliance plans.⁴

Carriers’ waiver petitions must “specify with sufficient particularity” information responsive to the questions and concerns described below.

(1) ***“What steps the carrier is taking or intends to take to provide users of TTY devices with the capability to operate such devices in conjunction with digital wireless phones.”***

The Wireless TTY Forum (“Forum”) has already submitted to the FCC information indicating that (1) a short-term “backward compatible” solution for GSM systems will be unavailable in the near term, and (2) a long-term “data solution” for GSM systems is feasible.

We request that you provide information regarding your efforts to develop either a short-term or long-term solution for your GSM products. Please explain what will be required in order to bring your products (and, thus, our systems) into compliance (e.g., new standards, testing, applicable handset or network software modifications). In this regard, we note that manufacturers have submitted similar information to the Forum and the CDG in conjunction with the Forum’s status reports to the FCC. If you have supplied such information we ask that you provide it to Western as well.

(2) ***“When the carrier intends to make this capability available to TTY users. This information should include well-documented timetables and milestones from the carrier regarding the implementation of this capability.”***

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The “consumer concerns” referenced in the September 30 Order refer to numerous TTY capability requirements and features requested by Consumer Representatives to the TTY Forum (copy attached). These capabilities and features include:

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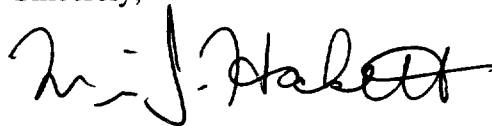
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Thank you in advance for your prompt attention to this matter. I can be reached via phone at (202) 261-2165, via fax at (202) 261-2166 or via e-mail at bill.hackett@wwireless.com.

Sincerely,



William J. Hackett
Regulatory Compliance Specialist

cc: Gene DeJordy, Esquire
Executive Director of Regulatory Affairs

APPENDIX

September 10, 1998

To: TTY Forum

Fr: Consumer Representatives

The CTIA has said that most of the consumer criteria previously submitted were not usable by the TTY Forum because the criteria covered marketing and distribution as well as design. Marketing and distribution issues for a possible "one-phone-model-per-technology" short-term plan will be taken up with CTIA's senior management, as suggested by them.

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13. Drive conditions must be supported, again using AMPS as a benchmark.



December 2, 1998

via Facsimile

Mr. Jim Van Bosch
Motorola
600 N. U.S. Highway 45
Libertyville, Illinois 60048

Re: Request for Information Concerning Digital 911/TTY
Capabilities for December 4, 1998, Waiver Request

Dear Mr. Van Bosch:

Section 20.18 of the Federal Communications Commission's ("FCC" or "Commission") rules requires that certain CMRS providers, including Western Wireless Corporation ("Western"), "be capable of transmitting 911 calls from individuals with speech or hearing disabilities through means other than mobile radio handsets, e.g., through the use of Text Telephone Devices (TTY)" and that Phase I and Phase II enhanced 911 capabilities be provided for such calls as well.¹ The rule went into effect on October 1, 1998, but the Wireless Telecommunications Bureau ("Bureau") has suspended enforcement of the rule for carriers with digital wireless systems through December 31, 1998.²

However, the Bureau has also established a waiver procedure for carriers not in compliance with the rules beginning January 1, 1999. To this end, affected carriers must "demonstrate their commitment to, and plans for, complying with Section 20.18(c)" Waiver petitions must be filed not later than December 4, 1998, and carriers must file submissions every three months after the date of the waiver grant to maintain the effectiveness of the waiver.

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The Bureau in its Order acknowledges that “users of TTY devices will not be able to operate such devices in conjunction with digital phones at any time in the near future.”³ The Commission has nonetheless “establish[ed] a waiver mechanism that requires carriers to provide specific information (including well-documented timetables and milestones) regarding their” compliance plans.⁴

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(1) ***“What steps the carrier is taking or intends to take to provide users of TTY devices with the capability to operate such devices in conjunction with digital wireless phones.”***

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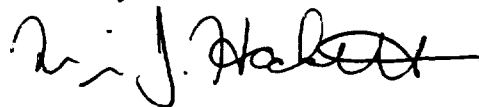
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APPENDIX

September 10, 1998

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13. Drive conditions must be supported, again using AMPS as a benchmark.



December 2, 1998

via Facsimile

Mr. Oscar Dayani
Mitsubishi
2001 Cherry Drive
Braselton, Georgia 30517

Re: Request for Information Concerning Digital 911/TTY
Capabilities for December 4, 1998, Waiver Request

Dear Mr. Dayani:

Section 20.18 of the Federal Communications Commission's ("FCC" or "Commission") rules requires that certain CMRS providers, including Western Wireless Corporation ("Western"), "be capable of transmitting 911 calls from individuals with speech or hearing disabilities through means other than mobile radio handsets, e.g., through the use of Text Telephone Devices (TTY)" and that Phase I and Phase II enhanced 911 capabilities be provided for such calls as well.¹ The rule went into effect on October 1, 1998, but the Wireless Telecommunications Bureau ("Bureau") has suspended enforcement of the rule for carriers with digital wireless systems through December 31, 1998.²

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As discussed herein, we are highly dependent on our vendors in preparing our waiver petition. Accordingly, we formally seek your immediate and continuing assistance in providing information needed to prepare a waiver petition and ask that you contact us upon receipt of this letter and provide us with a written response on or before December 3, 1998 to give Western adequate time to prepare its petition. If you are unable to provide information by this date, please inform us in writing when information responsive to the Commission's requirements (discussed below) will be available.

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The Bureau in its Order acknowledges that “users of TTY devices will not be able to operate such devices in conjunction with digital phones at any time in the near future.”³ The Commission has nonetheless “establish[ed] a waiver mechanism that requires carriers to provide specific information (including well-documented timetables and milestones) regarding their” compliance plans.⁴

Carriers’ waiver petitions must “specify with sufficient particularity” information responsive to the questions and concerns described below.

(1) ***“What steps the carrier is taking or intends to take to provide users of TTY devices with the capability to operate such devices in conjunction with digital wireless phones.”***

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We request that you provide information regarding your efforts to develop either a short-term or long-term solution for your GSM products. Please explain what will be required in order to bring your products (and, thus, our systems) into compliance (e.g., new standards, testing, applicable handset or network software modifications). In this regard, we note that manufacturers have submitted similar information to the Forum and the CDG in conjunction with the Forum’s status reports to the FCC. If you have supplied such information we ask that you provide it to Western as well.

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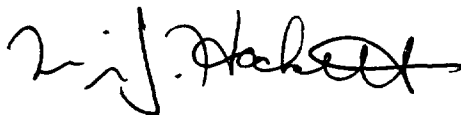
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APPENDIX

September 10, 1998

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December 2, 1998

via Facsimile

Mr. Jim Papadopolis
Bosch/AudioVox
FAX No. (516) 233-3449

Re: Request for Information Concerning Digital 911/TTY
Capabilities for December 4, 1998, Waiver Request

Dear Mr. Papadopolis:

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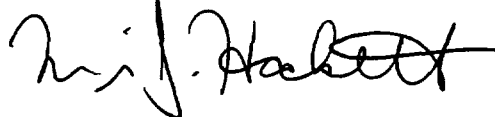
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5. The TTY user must have a means of tactile (vibrating) ring signal indication.
6. The caller must be able to transmit TTY tones independent of the condition of the receiving modem. (This is to permit baudot signalling by pressing a key, to let a hearing person know that the incoming call is from a TTY.)

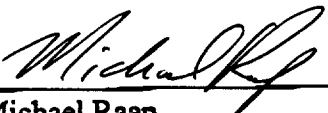
7. The *landline* party's TTY must not require retrofitting in order to achieve the desired error rate.
8. The *wireless* party's TTY may require retrofitting, or a new model TTY to be developed, or the use of a portable data terminal such as a personal digital assistant.
9. VCO and HCO should be supported where possible.
10. Reduction of throughput (partial rate) on Baudot is highly undesirable and should not be relied upon to achieve compliance (see #7). It may be useful as a user-selectable option to improve accuracy on a given call.
11. Call information such as ANI and ALI, where provided in wireless voice, should also be provided for TTY calls.
12. The solution need not support little-used or obsolete TTY models, but in general should support the embedded base of TTYs sold over the past ten years.. The landline equipment supported must not be limited to that used in Public Service Answering Points (911 centers).
13. Drive conditions must be supported, again using AMPS as a benchmark.

ATTACHMENT C

DECLARATION/VERIFICATION

I, Michael Raap, state as follows:

1. I am the Wireless Data and Messaging Manager at Western Wireless Corp.
2. As such, I am familiar with Western's efforts to comply with Section 20.18(c) of the Federal Communications Commission's rules and with the subject matter of the attached Petition for Waiver.
3. I have read the foregoing Petition for Waiver and the facts and statements contained therein are true and correct to the best of my knowledge, information and belief.



Michael Raap

Dated: Dec 3 98

CERTIFICATE OF SERVICE

I, Marionetta Holmes, hereby certify that on this 4th day of December, 1998, copies of the foregoing "Western Wireless Corporation Petition for Waiver of Section 20.18(c) of the Commission's Rules" in CC Docket No. 94-102 were served by hand on the following:

Chairman William E. Kennard
Federal Communications Commission
1919 M Street, NW, Room 814
Washington, D.C. 20554


Commissioner Gloria Tristani
Federal Communications Commission
1919 M Street, NW, Room 826
Washington, D.C. 20554

Commissioner Michael Powell
Federal Communications Commission
1919 M Street, NW, Room 844
Washington, D.C. 20554

Commissioner Harold Furchtgott-Roth
Federal Communications Commission
1919 M Street, NW, Room 802
Washington, D.C. 20554

Commissioner Susan Ness
Federal Communications Commission
1919 M Street, NW, Room 832
Washington, D.C. 20554

Daniel Python, Chief
Wireless Telecommunications Bureau
Federal Communications Commission
2025 M Street, N.W., Room 5002
Washington, DC 20554


Marionetta Holmes